2.2 Specialized Separation Utilizing 3M Membrane Technology

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Abstract

The overall objective of this project is to establish the commercial applicability of 3M Membrane Technology in the sampling/analysis and remediation of DOE liquids containing radionuclides and related metals. Small active particles (5-80 µ) have been identified for rapid selective separation of specific analytes and incorporated into membrane webs. Even in the presence of these small particles, these membranes allow high liquid flow. The preferred configurations of the membrane are cartridges for remediation systems and flat disks for sampling/analysis applications.

In this presentation, developments within the last year in the areas of Rapid Liquid Samplers (RLS) and selective removal cartridges will be highlighted.

- Savannah River Site R-basin cesium cartridge demonstration
- EML prototype low-cost field analyzer using cesium RLS
- Development of an effective strontium selective chemistry (over calcium) at neutral pH
- Production and laboratory testing of membranes incorporating a bifunctional anion exchange resin (biquat) for the removal of technetium
- Development of cobalt removal cartridges
- Copper cartridge demonstration at Columbia, MO
- Uranium RLS demonstration at Fernald, OH
- Results of test membranes with incorporated scintillating material
- Testing results of multiple types of remediation cartridges in series
- Commercialization activities and sales

Discussion of future activities will include:

- Demonstration of a 50 gallon per minute cartridge system for cesium at Columbus, OH
- Scale-up of production and testing of selective strontium particle for both RLS and remediation cartridge applications